

APPENDIX 4.1-15

*Land Exchange Alternative
Overview of Water Services*

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER
CONSULTING ENGINEERS

**OVERVIEW OF WATER SERVICE
FOR
OTAY RANCH VILLAGE 14
AND PLANNING AREA 16/19 –
LAND EXCHANGE EIR ALTERNATIVE
February 2018**

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LAND EXCHANGE EIR ALTERNATIVE**

February 2018



**Prepared by:
Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008**

Job No. 820-007

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ABBREVIATIONS

ac -	acre
AF -	acre-foot
AMSL -	above mean sea level
cfd -	community facilities district
cfs -	cubic feet per second
CRA -	Colorado River Aqueduct
GDP/SRP -	General Development Plan/Subregional Plan
gpd -	gallons per day
gpf -	gallons per flush
gpm -	gallons per minute
HOA -	homeowners association
IID -	Imperial Irrigation District
LAFCO -	Local Agency Formation Commission
mgd -	million gallons per day
MAF -	million acre-feet
MF -	multi-family land use designation
MWD -	Metropolitan Water District of Southern California
psi -	pounds per square inch
SAMP -	subarea master plan
SF -	single family land use designation
SDCWA -	San Diego County Water Authority
SWP -	State Water Project
UWMP -	Urban Water Management Plan

USEFUL CONVERSIONS

1 acre-foot	=	325,829 gallons
1 mgd	=	1,000,000 gallons/day
1 cfs	=	448.8 gpm
1 cubic foot	=	7.48 gallons
1 mgd	=	694.4 gpm

CHAPTER 1

INTRODUCTION

This report provides an overview of water service for the Otay Ranch Village 14 and Planning Areas 16/19 Land Exchange Project (Land Exchange Alternative). This report will estimate water demands for the Land Exchange Alternative, outline regional water facilities to be constructed, and recommend onsite facilities to accommodate project demands. The report includes an overview of water supplies in the region and recommends water facilities specific to the needs of the Land Exchange Alternative project.

OVERVIEW AND BACKGROUND

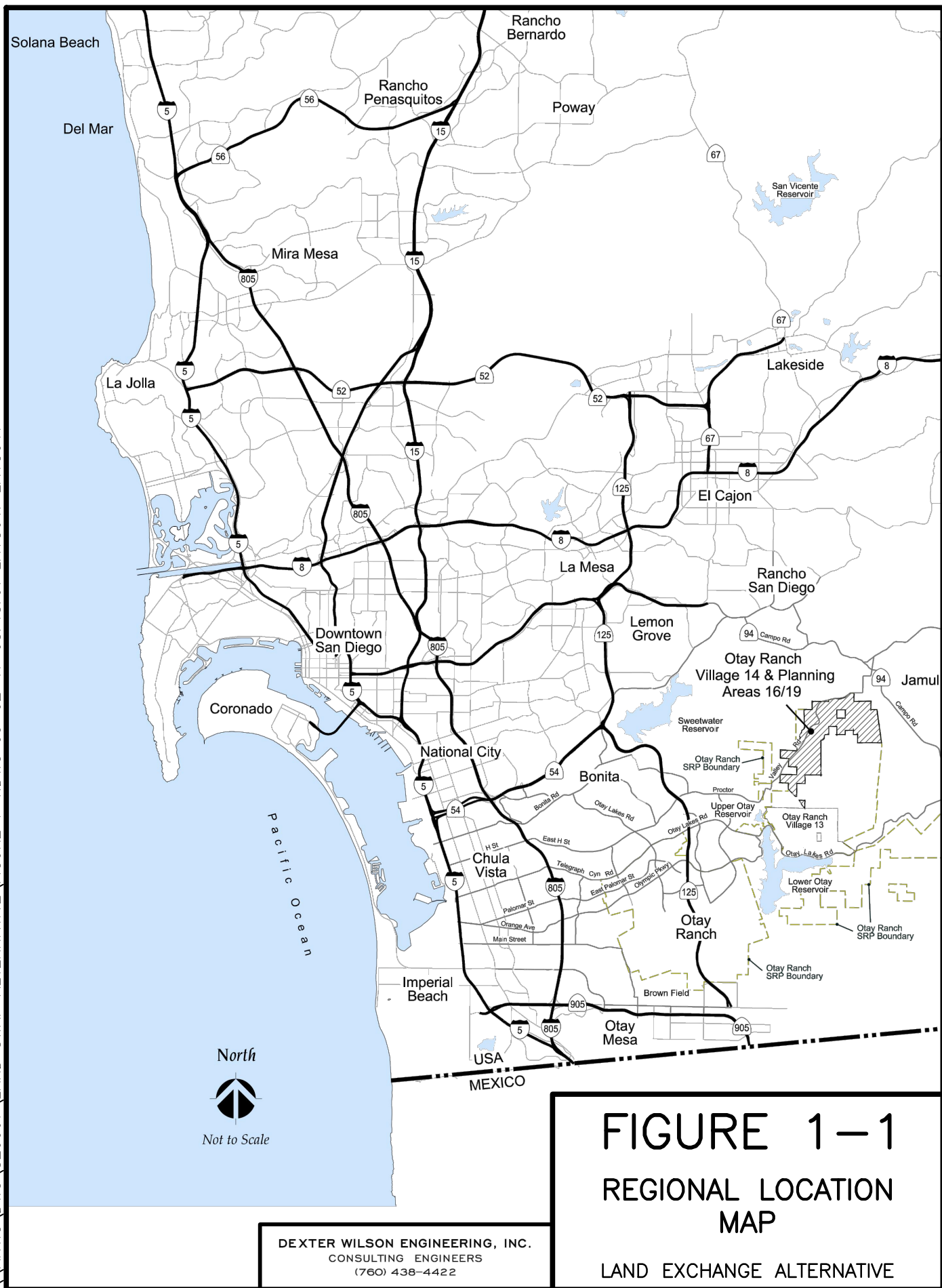
This technical report provides a project level analysis of the Land Exchange Alternative (defined below) for inclusion in the Otay Ranch Village 14 and Planning Areas 16/19 Environmental Impact Report (EIR). The regional location is shown in Figure 1-1.

The Land Exchange Alternative is located within Otay Ranch Village 14 and Planning Areas 16 and 19 in the Proctor Valley parcel of Otay Ranch as shown on Figure 1-2. Village 14 and Planning Areas 16 and 19 are part of the larger Otay Ranch, an approximately 23,000-acre master-planned community in southern San Diego County designed as a series of villages and planning areas.

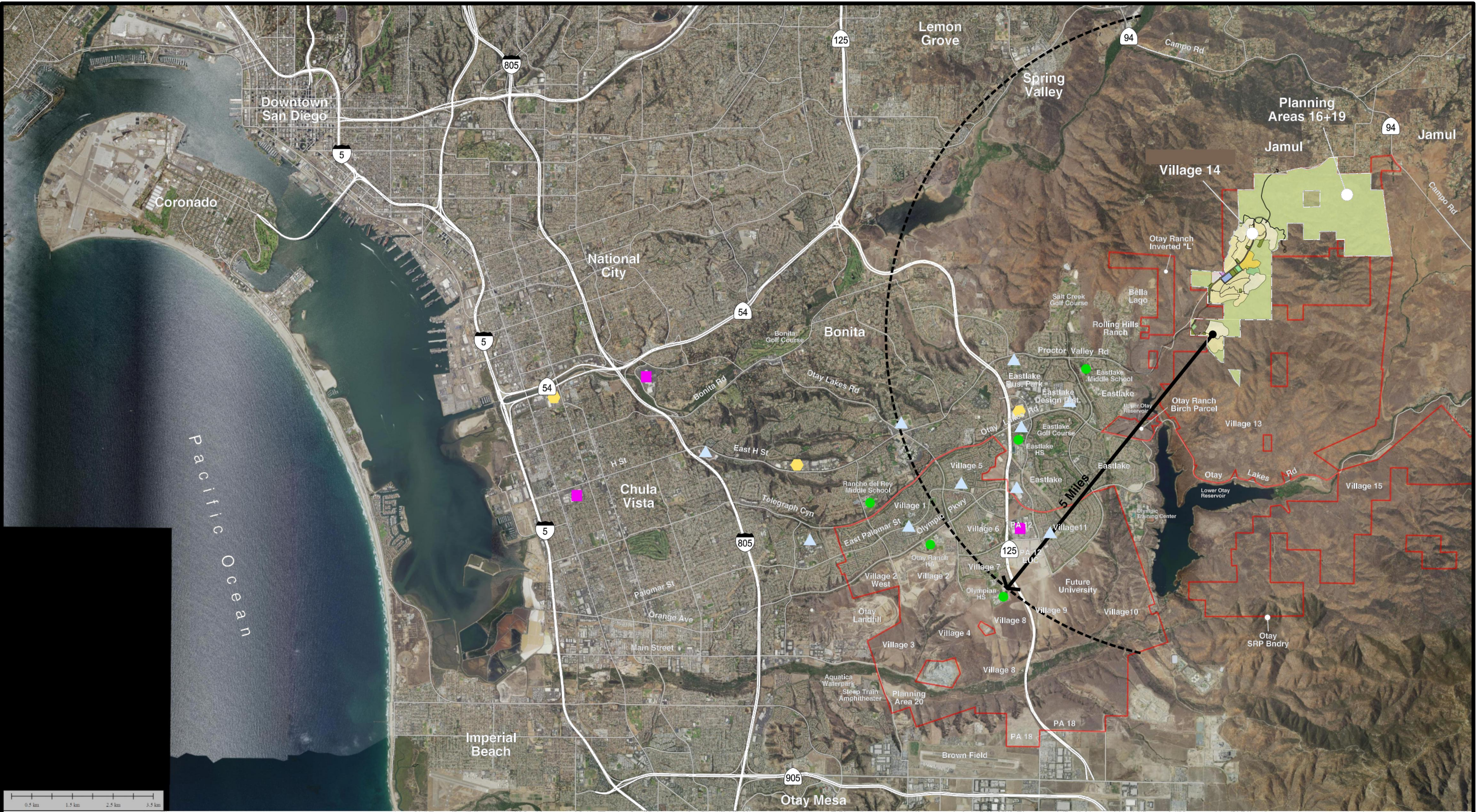
The Land Exchange Alternative proposes 1,530 homes within a development footprint that is limited to Proctor Valley Village 14. The majority of Planning Areas 16 and 19 would be converted to MSCP and Otay Ranch RMP Preserve and would not be developed.

The following describes the major components and characteristics of the Land Exchange Alternative.

\\ARTIC\DWG\820007\LAND SWAP ALTERNATIVE\FIGURE 1-1.DWG 05-02-17 08:48:01 LAYOUT: LAYOUT1



\\ARTIC\DWG\820007\LAND SWAP ALTERNATIVE\FIGURE 1-2.DWG 05-02-17 09:10:02 LAYOUT: LAYOUT



LEGEND

- Retail
- Regional (pink square)
 - Big Box (yellow hexagon)
 - Local (blue triangle)
 - Secondary School (7-12) (green circle)
 - Otay SRP Boundary (red line)

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FIGURE 1-2

AERIAL LOCATION MAP

LAND EXCHANGE ALTERNATIVE

DEFINITIONS

“Land Exchange Area” Defined

As indicated above, the “Land Exchange Area” is located within Otay Ranch Village 14 and Planning Areas 16 and 19 as depicted in Figure 3. The total Land Exchange Area covers approximately 2,387 acres, of which the Applicant owns 1,294 acres, the State owns approximately 1,053 acres, and 39.9 acres are Offsites. Within the Land Exchange Area, there are 1,003 acres in Village 14 and 1,345 acres in Planning Areas 16 and 19. Offsites include Proctor Valley Road and related utilities in the south and central portions of Village 14. The State’s ownership is included in order to process a General Plan Amendment to remove existing approved Otay Ranch GDP/SRP County General Plan development land uses and convert these acres to MSCP/Otay Ranch RMP Preserve.

“Land Exchange Alternative” Defined

The Land Exchange limits development to Otay Ranch Village 14 and converts the majority of development approved by the Otay Ranch GDP/SRP in Planning Areas 16 and 19 to MSCP and Otay Ranch RMP Preserve. The Land Exchange Alternative assumes the completion of a land exchange agreement with the State of California and a simultaneous boundary adjustment to the MSCP and RMP Preserve systems.

Specifically, the "Land Exchange Alternative" proposes to:

- Exchange 278 acres owned by the State in Village 14 for 278 acres owned by the Applicant in Planning Area 16.
- Amend MSCP and Otay Ranch RMP Preserve boundaries via a boundary adjustment where approximately 169.8 acres in Planning Areas 16/19 are converted to Otay Ranch RMP Preserve and 142.3 acres in Village 14 are converted to Otay Ranch RMP Preserve and 43.6 acres in Village 14 are converted to development footprint for a net increase in Otay Ranch RMP Preserve of 268.5 acres.

After implementation, the Land Exchange Alternative land plan is depicted in Figure 1-4. The Land Exchange Alternative contemplates a Specific Plan, General Plan Amendments, EIR, Rezone, Tentative Map, the Otay Ranch RMP Amendment, and County MSCP Subarea Plan South County Segment Boundary Adjustment.

Table 1-1
Otay Ranch Land Exchange Alternative
Site Utilization Plan - Land Use Summary
January 29, 2018

Proctor Valley Village 14		Acres	Units	Density
Residential Uses				
Single Family Residential				
R-1	SF-2	28.9	112	3.9
R-2	SF-2	37.1	72	1.9
R-3	SF-1	41.7	67	1.6
R-4	SF-2	14.3	57	4.0
R-5	SF-2	33.9	109	3.2
R-6	SF-2	30.6	75	2.4
R-7	SF-2	32.1	91	2.8
R-8	SF-2	20.1	47	2.3
R-9	SF-1	41.5	74	1.8
R-10	Age Restricted SF-1	42.5	127	3.0
R-11	Age Restricted SF-1	34.4	156	4.5
R-12	SF-2	12.3	44	3.6
R-13	SF-1	36.4	66	1.8
R-14	SF-2	26.9	60	2.2
R-15	SF-1	38.5	59	1.5
R-16	SF-3	31.7	191	6.0
Single Family Subtotal		503.1	1,407	2.8
Multi-Family & Mixed Use				
MF-1		4.6	69	15.2
MU-1 (2)		3.5	54	15.5
MF & Mixed Use Subtotal		8.0	123	15.3
Residential Subtotal (3)		511.2	1,530	3.0
Non-Residential Uses				
Public Parks				
P-1	Village Green	3.9		
P-2	Overlook Park	4.2		
P-3	South Park	2.9		
P-4	Scenic Park	2.5		
Public Parks Subtotal		13.5		
Private Parks				
PP-1	South	0.8		
PP-2	Central	1.0		
PP-3	Senior Activity Center	1.8		
PP-4	North	1.4		
PP-5	Village Core	1.9		
Private Parks/ Recreation Subtotal		6.9		
Public Uses				
	Public Safety	2.3		
	Elementary School	8.3		
Public Uses Subtotal		10.6		
Open Space & Preserve				
	Internal Open Space (4)	33.4		
	Preserve	403.9		
Open Space & Preserve Subtotal		437.3		
Circulation Subtotal (5)		23.1		
Non-Residential Uses Subtotal		491.4		
Proctor Valley Village 14 Subtotal		1,002.6	1,530	1.5
Planning Area 16/19 Preserve				
	Circulation in Preserve (6)	16.4		
	Preserve	276.3		
	Exchange to State for preserve	278.0		
	Existing State Ownership (portion)	774.1		
Planning Area 16/19 Preserve Subtotal		1,344.8		
Proctor Valley Village and Preserve Grand Total		2,347.3	1,530	0.7

NOTES

(1) Additional offsites excluded from the acreage above include:

Proctor Valley Road Offsite Central & South 40.2
Offsite Sewer to Salt Creek Interceptor

(2) Mixed Use acreage includes 15,000 sf of commercial use

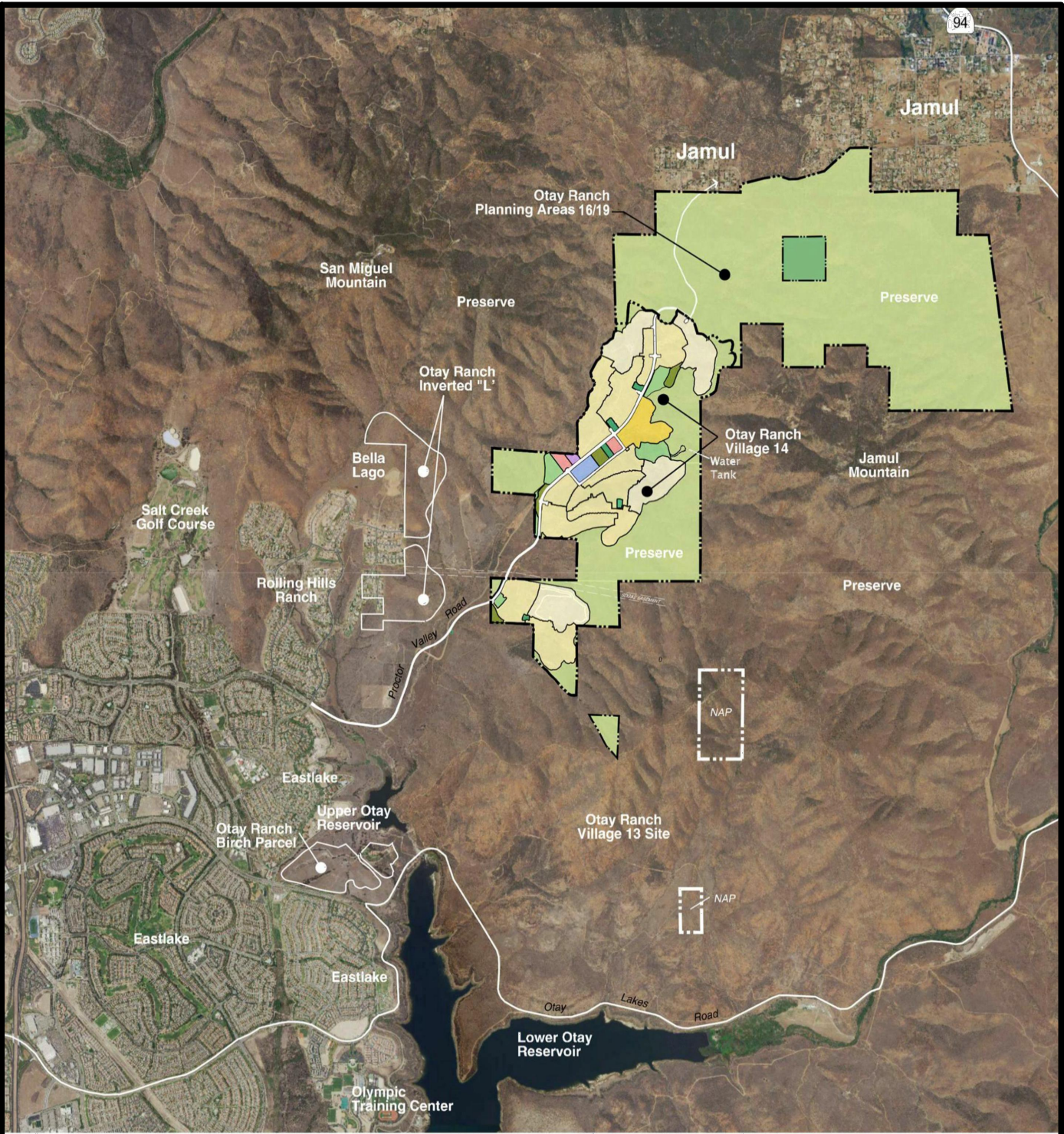
(3) Residential acreage includes 153.2 acres of fuel mod and internal open space slopes and 2.6 acres of private pocket parks.

(4) Open Space included 11.3 acres of basins and HOA open space lots not included in the residential acreage.

(5) Proctor Valley Road Onsite in Village 14 only

(6) Proctor Valley Road north in Planning Area 16 is in Preserve

\\ARTIC\DWG\820007\LAND SWAP ALTERNATIVE\FIGURE 1-3.DWG 11-10-17 11:24:15 LAYOUT: LAYOUT1



LAND EXCHANGE ALTERNATIVE

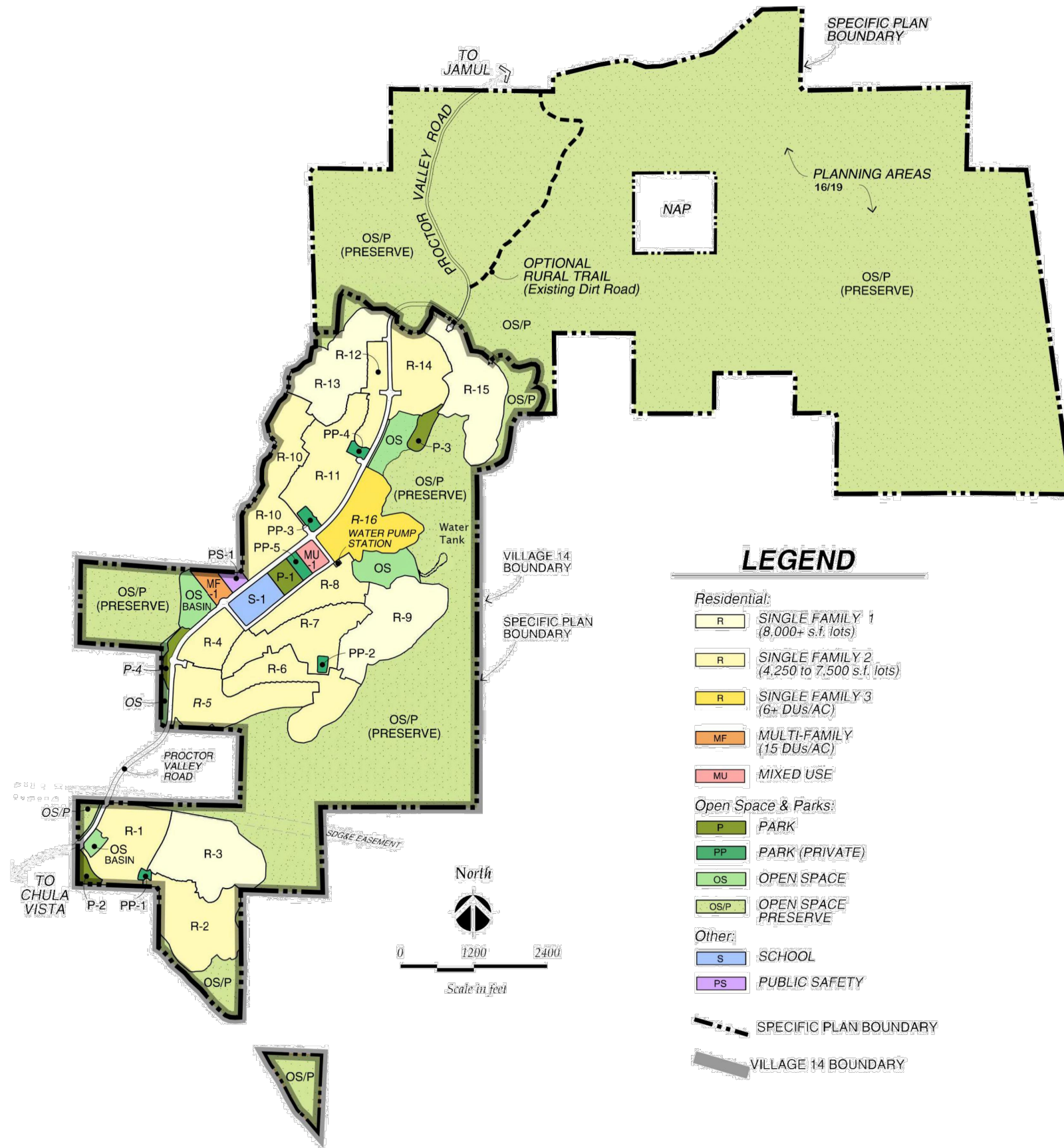
FIGURE 1-3

PLANNING AREA MAP

LAND EXCHANGE ALTERNATIVE

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\\ARTIC\DWG\820007\LAND SWAP ALTERNATIVE\FIGURE 1-4.DWG 11-10-17 11:30:27 LAYOUT: LAYOUT



Land Exchange Alternative

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FIGURE 1-4
OVERALL LAND USE PLAN
LAND EXCHANGE ALTERNATIVE

“Village 14” Defined

“Village 14” as referred to herein is a discrete subset of the Land Exchange and reflects that portion located exclusively within Village 14 as depicted in Figure 1-5. The majority of the technical reports focus on Village 14 as this is where the development is planned.

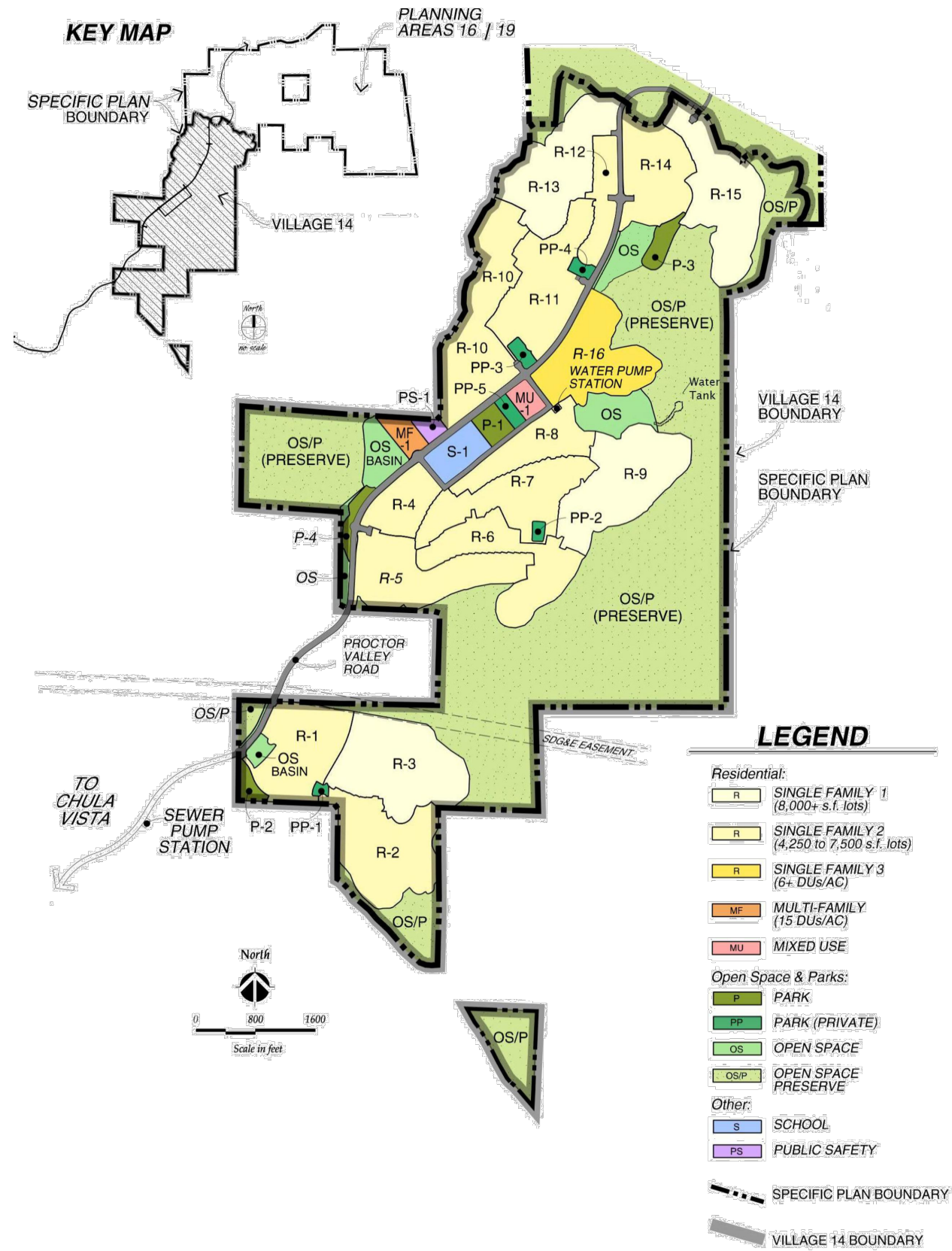
PROPOSED SPECIFIC PLAN

Summary

The adopted Otay SRP requires the preparation of a Site Utilization Plan that describes the land uses. Figures 1-4 and 1-5 depict the proposed Site Utilization Plan for the Land Exchange Alternative. Additionally, Table 1-1 quantifies the land uses.

The Land Exchange Alternative includes approximately 511 acres designated for 1,530 homes, 1,124 of which would be traditional single-family homes, 283 would be single family age-restricted and 123 would be multifamily homes as indicated on Table 1-1. 18 neighborhoods are planned with approximate densities ranging from 1.5 to 15.0 dwelling units per acre. The age-restricted neighborhoods would be gated, as would four of the single-family neighborhoods situated on the largest lots.

Village 14 in the Land Exchange Alternative is planned around a Village Core, centrally located in the heart of the village. Higher density residential uses will be adjacent to the Village Core with single family residential radiating out in decreasing densities. The Village Core is comprised of the Neighborhood Center which includes an 8-acre elementary school; a 4-acre Village Green (public park); a 3-acre Mixed Use Site with up to 15,000 square feet of commercial/retail uses and 54 multi-family homes; and a 2-acre Village Square Community Facility. The Village Core also includes a 2-acre public safety site for a fire station and sheriff's storefront facility and 69 multi-family townhomes located adjacent to the public safety site.



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FIGURE 1-5

VILLAGE 14 LAND USE PLAN

LAND EXCHANGE ALTERNATIVE

The Land Exchange Alternative is designed around an active lifestyle and wellness recreation theme and includes an extensive park and recreation system including four public parks totaling 13 acres as depicted on Figure 1-5. The remaining private recreation facilities include three private swim clubs, a senior activity center, the Village Square community facility and numerous pocket parks totaling approximately 9 acres. Approximately 4.6 miles of community pathway are proposed on the Proctor Valley Road. Approximately three miles of Park-to-Park Loop connect to the regional pathway.

After implementing the proposed land exchange agreement, MSCP and RMP Preserve boundary adjustment, and General Plan Amendment, the Land Exchange will include 1,749 acres of land for MSCP and Otay Ranch RMP Preserve, consisting of 404 acres in Proctor Valley Village 14, and 1,345 acres in Planning Areas 16 and 19.

WATER SERVICE

The Land Exchange Alternative is within the boundaries of the Otay Water District (OWD), San Diego County Water Authority (SDCWA), and Metropolitan Water District of Southern California (MWD) for water service. Retail water service for the Land Exchange Alternative is to be provided by the OWD. The Land Exchange Alternative will require annexation into an OWD Improvement District in order to obtain water service. This annexation is an internal discretionary action by OWD and requires a written request and payment of processing fees.

The OWD has existing and planned facilities in the vicinity of the Land Exchange Alternative and water service can be provided by expanding the existing system. In particular, water service will be provided by the 980 Pressure Zone (980 Zone) within the Central Area System and the 1296 Pressure Zone (1296 Zone) within the Regulatory System of the OWD. The 980 Zone currently includes two pump stations which pump water into two existing 980 Zone reservoirs approximately two miles to the west of the Land Exchange Alternative. There are three existing 1296 Zone Reservoirs approximately one quarter mile to the north of the Land Exchange Alternative and 1.5 miles northeast of Village 14. This report will provide recommendations for improving and expanding the 980 Zone and 1296 Zone as needed to provide water service to the Land Exchange Alternative.

PURPOSE OF STUDY

This report provides an overview of water service for the Land Exchange Alternative. This document is prepared as a supporting document for the Projects Specific Plan and EIR. The developer of the Land Exchange Alternative will be required to prepare, for review and approval by the OWD, a Subarea Master Plan (SAMP) concurrent with the processing of preliminary final engineering plans. The SAMP will provide more detailed information on project phasing, pump station and reservoir capacity requirements, water system improvements and processing requirements, and computer modeling to justify recommended pipe sizes.

PROCESSING SUMMARY

A summary of the major permits and process approvals that must be completed prior to the Land Exchange Alternative being eligible for water service from OWD include:

- Project EIR, Specific Plan and Tentative Map(s) approvals through County of San Diego
- Water Supply Assessment and Verification Report
- OWD Improvement District annexation approval
- Approval of SAMP by OWD
- Final Engineering Improvement Plan approvals

CHAPTER 2

DESIGN CRITERIA AND PROJECTED WATER DEMANDS

This chapter presents the design criteria used to evaluate the water system for the Land Exchange Alternative. The design criteria are utilized for analysis of the existing water system as well as for design and sizing of proposed improvements and expansions to the existing system to accommodate demands in the study area. Unless otherwise noted, this criteria is taken from the OWD 2015 Water Facilities Master Plan Update.

Duty Factors and Peaking Factors

Table 2-1 presents the duty factors used in projecting the total average demand for the Land Exchange Alternative. The required fire flows and durations are also listed. Actual fire flow requirements will be determined as site specific details such as building footprints and construction materials become available. The fire flow requirements listed in Table 2-1 are used by the OWD in master planning their overall water system. A fire flow of 2,500 gpm was used for single family residential development because the OWD Master Plan identifies the project area as being in a high severity zone.

TABLE 2-1 WATER DUTY FACTORS			
Land Use Designation	Unit Domestic Demand	Required Fire Flow (gpm)	Required Fire Flow Duration (hours)
Rural Residential (<1 DU/AC)	1,000 gpd/unit	2,500	2
Single Family – Low (1-3 DU/AC)	700 gpd/unit	2,500	2
Single Family – Medium (3-10 DU/AC)	435 gpd/unit	2,500	2
Multi-Family (>10 DU/AC)	200 gpd/unit	2,500	2
Commercial	1,785 gpd/ac	3,500	3
Public Safety	1,785 gpd/ac	3,500	4
School	1,785 gpd/ac	5,000	4
Park	1,900 gpd/ac	-----	-----

To convert average day potable water demands to maximum day demands, Figure 4-1-2 (Curve 2) from the Water Agency Standards was utilized. To convert average day potable water demands to peak hour demands, Figure 4-1-1 (Curve 2) from the Water Agency Standards was used.

System Pressures

Generally, the potable water distribution system is designed to maintain static pressures between 65 psi and 200 psi. This criteria is used to initially divide a project between water service zones. The potable water distribution system has been designed to yield a minimum of 40 psi residual pressure at any location under peak hour demand flows, and a minimum residual pressure of 20 psi during maximum day demand plus fire flow conditions. Potable water mains are sized to maintain a maximum velocity of 10 feet per second under a maximum day plus fire flow scenario and a maximum velocity of 6 feet per second under peak hour flow conditions.

Pump Station

Pump stations are sized for a firm capacity equivalent to the maximum day demand of the zone being served and all higher zones supplied by the pump station. Firm capacity is defined as the pumping capacity of the station when one pumping unit is out of service. To allow OWD flexibility to avoid pumping during peak electricity times, the pumps will be sized to allow pumping to occur over a 16 hour period.

Reservoirs

Reservoir storage consists of operational storage, emergency storage, and fire flow storage. Operational storage is to be equivalent to 30 percent of the maximum daily demand for the area being served. Emergency storage is to be equivalent to 100 percent of the maximum daily demand for the area be served. Fire flow storage is to be based on the highest fire flow and duration required within the service area. Where multiple reservoirs are provided within a pressure zone, the fire flow storage requirement applies to the whole zone and not to each individual reservoir.

Projected Water Demands

The use of recycled water within watersheds tributary to surface water storage reservoirs that provide supply for domestic water uses must be approved by the owners of the reservoirs in order to protect water quality in these reservoirs. The Applicants for other projects in this watershed have met with and discussed the use of recycled water with the City of San Diego, the operator of the reservoirs. The City of San Diego has requested that all projects not use recycled water because they are concerned about the runoff from the project entering the project and increasing nutrients and salinity. For this reason, the projected water use within the Land Exchange Alternative has been estimated with the assumption that the use of recycled water within the project will not be allowed. Table 2-2 provides the projected potable water demand for the Land Exchange Alternative by pressure zone. The total estimated average potable water use is 0.89 mgd. This demand will be supplied from OWD's 980 Zone and 1296 Zone Systems, as discussed in Chapter 4.

TABLE 2-2 LAND EXCHANGE ALTERNATIVE PROJECTED POTABLE WATER DEMANDS					
Neighborhood	Land Use Designation	Gross Acres	Quantity Units	Water Duty Factor	Total Average Water Demand, GPD
980 Zone					
R-1	SF Residential	28.9	112	435 gpd/unit	48,720
R-2	SF Residential	37.1	72	700 gpd/unit	50,400
R-3	SF Residential	41.7	67	700 gpd/unit	46,900
R-4	SF Residential	14.3	57	435 gpd/unit	24,795
R-5 (portion)	SF Residential	23.0	73	435 gpd/unit	31,755
R-6 (portion)	SF Residential	7.8	18	700 gpd/unit	12,600
R-7 (portion)	SF Residential	15.5	45	700 gpd/unit	31,500
R-8 (portion)	SF Residential	12.0	32	700 gpd/unit	22,400
R-10	SF Residential	42.5	127	435 gpd/unit	55,245
R-11 (portion)	SF Residential	31.9	148	435 gpd/unit	64,380
R-12 (portion)	SF Residential	6.2	22	435 gpd/unit	9,570
R-16	SF Residential	31.7	191	435 gpd/unit	83,085
MF-1	MF Residential	4.6	69	200 gpd/unit	13,800
MU-1	Mixed Use-Res	---	54	200 gpd/unit	10,800
MU-1	Mixed Use-Com	3.6	---	1,785 gpd/ac	6,425
P-1, P-2, P-4	Public Park	10.6	---	1,900 gpd/ac	20,140

TABLE 2-2
LAND EXCHANGE ALTERNATIVE
PROJECTED POTABLE WATER DEMANDS

Neighborhood	Land Use Designation	Gross Acres	Quantity Units	Water Duty Factor	Total Average Water Demand, GPD
PP-1, PP-3, PP-4, PP-5	Private Park	5.9	---	1,900 gpd/ac	11,210
FS-1	Public Safety	2.3	---	1,785 gpd/ac	4,105
S-1	School	8.3	---	1,785 gpd/ac	14,815
OS	Irr. Slopes	8.5	---	1,900 gpd/ac	16,150
Subtotal 980 Zone		337.5	1,087		578,795
1296 Zone					
R-5 (portion)	SF Residential	10.9	36	435 gpd/unit	15,660
R-6 (portion)	SF Residential	22.8	57	700 gpd/unit	39,900
R-7 (portion)	SF Residential	16.6	46	700 gpd/unit	32,200
R-8 (portion)	SF Residential	8.1	15	700 gpd/unit	10,500
R-9	SF Residential	41.5	74	700 gpd/unit	51,800
R-11 (portion)	SF Residential	2.5	8	435 gpd/unit	3,480
R-12 (portion)	SF Residential	6.1	22	435 gpd/unit	9,570
R-13	SF Residential	36.4	66	700 gpd/unit	46,200
R-14	SF Residential	26.9	60	700 gpd/unit	42,000
R-15	SF Residential	38.5	59	700 gpd/unit	41,300
P-3	Public Park	2.9	---	1,900 gpd/ac	5,510
PP-2	Private Park	1.0	---	1,900 gpd/ac	1,900
OS	Irr. Slopes	6.0	---	1,900 gpd/ac	11,400
Subtotal 1296 Zone		218.4	443		311,420
OS	Slopes/Preserve	424.8	---	---	---
Circulation	Roads	22.0	---	---	---
TOTAL		1,002.7	1,530		890,215

CHAPTER 3

WATER SUPPLY

Urban Water Management Planning Act

In 1983, the Legislature enacted the Urban Water Management Planning Act (California Water Code sections 10610 through 10656), which requires every urban water supplier that provides water to 3,000 or more customers, or over 3,000 acre feet (af) of water annually, to make every effort to ensure the appropriate level of reliability in its water service to meet the needs of its customers during normal, dry, and multiple-dry years. The UWMP is required in order for a water supplier to be eligible for the Department of Water Resources (DWR) administered state grants, loans, and drought assistance. The UWMP provides information on water use, water resources, recycled water, water quality, reliability planning, demand management measures, best management practices, and water shortage contingency planning for a specified service area or territory.

Senate Bills 610 and 221

California Water Code Sections 10631, 10656, 10910, 10911, 10912, and 10915 are referred to as Senate Bill (SB) 610 and Government Code Sections 65867.5, 66455.3, and 66473.7 are referred to as SB 221. SB 610 and SB 221 amended state law, effective January 1, 2002, intending to improve the link between the information on water supply availability and certain land use decisions made by cities and counties. SB 610 requires that the water purveyor of the public water system prepare a water supply assessment to be included in the California Environmental Quality Act (CEQA) environmental documentation and approval process of certain proposed projects. SB 221 requires affirmative written verification from the water purveyor of the public water system that sufficient water supplies are to be available for certain residential subdivision of property. SB 610 requires a city or county to evaluate whether water supplies will be sufficient to meet the projected water demand for certain “projects” that are otherwise subject to the requirement of CEQA. SB 610 provides its own definition of “project” in Water Code Section 10912.

Urban Water Management Plans

The California Urban Water Management Planning Act requires that each urban water supplier providing water for municipal purposes, either to more than 3,000 customers, or more than 3,000 acre-feet of water annually, must prepare, adopt, and update a UWMP at least once every five years on or before December 31, in years ending in five and zero. This applies to MWD, SDCWA, and its member agencies, including OWD, that serve unincorporated San Diego County. The intent of an UWMP is to present information on water supply, water usage/demand, recycled water, and water use efficiency programs in a respective water district's service area. An UWMP also serves as a valuable resource for planners and policy makers over a 25 year time frame.

The UWMP process ensures that water supplies are being planned to meet future growth. UWMPs are developed to manage the uncertainties and variability of multiple supply sources and demands over the long term. Water agencies and districts update their demand and supply estimates based on the most recent San Diego Association of Governments (SANDAG) forecast approximately every five years to coincide with preparation of their UWMPs. The most current supply and demand projections are contained in the 2015 UWMPs of MWD, SDCWA, and OWD. SDCWA member districts rely on the UWMPs and Integrated Resources Plans (IRPs) of MWD and the Regional Water Facilities Master Plan of SDCWA for documentation of supplies available to meet projected demands.

Normal year, single-dry year, and multiple-dry year 2015 UWMP supply and demand assessments for MWD, SDCWA, and OWD are intended to describe the water supply reliability and vulnerability to seasonal or climatic conditions, to the extent practical. Normal water years are considered to be years that experience average rainfall for the respective district. Single-dry water years are considered one year drought events. Multiple-dry water years refer to a series of below average rainfall for particular areas (i.e., multiple drought year conditions). Projections for multiple-dry years are made in five year increments. In the 2015 UWMPs, MWD, SDCWA and all SDCWA member agencies, including OWD, that serve unincorporated San Diego County determined that adequate water supplies would be available to serve existing service areas under normal year, single-dry year, and multiple-dry year conditions through the year 2040.

REGIONAL AND LOCAL WATER SUPPLY

Metropolitan Water District

MWD supplies water to approximately 18.7 million people in a 5,200-square mile service area that includes portions of Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego counties. SDCWA is one of MWD's 26 member agencies. Supply and demand projection information for MWD is included in its 2015 Regional UWMP, adopted in May 2016. MWD's long-term strategy for a sustainable water supply is outlined in its Integrated Resources Plan (IRP), updated approximately every five years, and last updated in October 2015. MWD's IRP identifies a mix of resources (imported and local) that will provide 100 percent reliability for full-service demands through the attainment of regional targets set for conservation, local supplies, SWP supplies, Colorado River supplies, groundwater banking, and water transfers through the year 2040. SDCWA is the largest MWD agency in terms of delivery, purchasing approximately 25 percent of MWD's water. MWD gets its water from two sources. The first source is the Colorado River, which is connected to MWD's six-county service area through a 242-mile aqueduct. The aqueduct system is known as the Central Valley Project (CVP). The CVP is operated by the U.S. Bureau of Reclamation. The second source is water from northern California, which supplies water through a series of dams, aqueducts, pipelines, and other facilities known as the State Water Project (SWP). The SWP is operated by the California Department of Water Resources (DWR). From the Colorado River Agreement (CRA), MWD is apportioned 550,000 acre-feet of water per year (AFY) from the Colorado River. Despite this low apportionment, MWD was able to transport up to 1.2 million acre-feet (MAF) through the CRA in past years by relying on unused apportionments from Arizona, Nevada, and California agricultural agencies. However, because MWD's firm water supply from the CRA is only 550,000 AF that is the number planning agencies must rely on for development. To supplement this supply, MWD also has several existing programs and programs being developed in cooperation with other agencies.

From the SWP, MWD is contractually entitled to receive 1,911,000 AF of water; however, the level of SWP supply development, state and federal environmental regulations, and other factors have restricted and, in some cases, reduced actual amount of available SWP water. As a result of these and other limitations, MWD estimates that actual SWP supplies will be 701,000 AF in a dry year and 566,000 AF during multiple dry years, with Delta improvements.

In May 2016, the MWD adopted its 2015 Regional UWMP, which is an update to its prior 2010 Regional UWMP. In its 2015 UWMP, MWD evaluated water supply reliability, over a 20-year period, for average, single-dry, and multiple-dry years. To complete its most recent water supply reliability assessment, MWD developed estimates of total retail demands for the region, factoring in the impacts of conservation. After estimating demands, the water reliability analysis identified current supplies and supplies under development to meet projected demands. MWD's reliability assessment showed that MWD can maintain reliable water supplies to meet projected demands through the year 2040. MWD also identified buffer supplies, including other SWP groundwater storage and transfers, which could serve to supply additional water needs. Appendix A-3 to the MWD 2015 Regional UWMP contains detailed justifications for the sources of supply projected to meet water demands in the region, including Colorado River Aqueduct deliveries (Colorado River supplies) and California Aqueduct deliveries (SWP supplies).

San Diego County Water Authority (SDCWA)

The SDCWA service area covers approximately 951,000 acres and encompasses the western third of San Diego County. SDCWA has 24 member agencies, 15 of which provide water to unincorporated areas of San Diego County. The SDCWA is responsible for ensuring a safe and reliable water supply to support the region's economy and the quality of life for three million residents. Because of the County's semi-arid climate and limited local water supplies, SDCWA has historically imported between 70 and 95 percent of the water used in the San Diego region from MWD. In 2008, MWD provided 71 percent of the San Diego region's water supply. Most of this water is obtained from the Colorado River and the SWP through a system of pipes, aqueducts, and associated facilities. Through development of new local water supply sources such as the Carlsbad Desalination Plant, SDCWA has become increasingly less reliant on MWD water supplies in recent years.

Both MWD and SDCWA provide water supplies to their member agencies in order to meet projected water demand based upon regional population forecasts. The San Diego Association of Governments (SANDAG) is responsible for providing and updating land use planning and demographic forecasts for San Diego County. MWD and SDCWA update their water demand and supply estimates based on the most recent SANDAG forecasts approximately every five years to coincide with preparation of the their respective UWMPs.

In June 2016, the SDCWA adopted its 2015 UWMP, updating the previously adopted 2010 UWMP. Sections 4, 5, and 6 of SDCWA's 2015 UWMP contain documentation of SDCWA's existing and planned water supplies, including MWD supplies (imported Colorado River water and SWP water), SDCWA supplies, and local member agency supplies (surface water reservoirs, water recycling, groundwater, and groundwater recovery). SDCWA supplies include (1) IID water transfer supplies, (2) Supplies from conservation projects to line the All-American Canal and the Coachella Canal, located in Imperial and Coachella Valleys, and (3) development of a seawater desalination facility at the Encina Power Plant in Carlsbad, which is anticipated to produce 56,000 AFY of additional water supplies. (See Table 3-1 below.)

Additionally, since 1980, approximately 5 percent to 30 percent of the member agencies water has come from local sources, primarily from surface water reservoirs as indicated in Table 3-1. Recycled water and groundwater recovery projects are growing in importance in the region, and water conservation efforts have also made SDCWA member agencies less dependent on imported water.

TABLE 3-1 PROJECTED NORMAL YEAR WATER SUPPLIES (AFY)					
WATER SOURCE	2020	2025	2030	2035	2040
Water Authority Supplies					
IID Water Transfer	190,000	200,000	200,000	200,000	200,000
Supply from MWD	136,002	181,840	207,413	224,863	248,565
Coachella Canal and All American Canal Lining Projects	80,200	80,200	80,200	80,200	80,200
Regional Seawater Desalination	50,000	50,000	50,000	50,000	50,000
Member Agency Supplies					
Surface Water	51,580	51,480	51,380	51,280	51,180
Water Recycling	40,459	43,674	45,758	46,118	46,858
Groundwater	17,940	19,130	20,170	20,170	20,170
Seawater Desalination	6,000	6,000	6,000	6,000	6,000
Brackish Groundwater Recovery	12,100	12,500	12,500	12,500	12,500
TOTAL PROJECTED SUPPLIES	587,581	648,124	676,721	694,431	718,773

Source: San Diego County Water Authority 2015 Urban Water Management Plan.

Section 9 of SDCWA's 2015 UWMP evaluates water supply reliability in average, single-dry, and multiple-dry years. Based on SDCWA's water supply reliability assessment, SDCWA concluded that water supplies would be sufficient through 2040. (See section below regarding Summary of Water Supplies and Demand, and Tables 3-2 through 3-4.)

Based on the imported and member agency local water sources discussed above, SDCWA estimates that it, along with member agency local sources will be able to supply 587,581 AF of water in 2020, as demonstrated in Table 3-1 above. Therefore, according to the MWD and SDCWA 2015 UWMPs, there is available water to meet all of the region's anticipated demand, including development of the Land Exchange Alternative, in average/normal and dry water years, as demonstrated in Table 3-2, Table 3-3 and Table 3-4, below. A Water Supply Assessment and Verification Report will need to be prepared for the Land Exchange Alternative by OWD to further detail the water supply assumptions and findings of OWD, SDCWA, and MWD. The reason that supplies exactly meet demands in Table 3-2 is that SDCWA only imports the amount of water necessary to meet demand. In Tables 3-3 and 3-4, years that show a deficit would require the use of water storage offsets and management actions to balance demand and supplies. These tables simply indicate that SDCWA has adequate supply to meet projected demands

TABLE 3-2 AVERAGE/NORMAL WATER YEAR SUPPLY AND DEMAND ASSESSMENT (AFY)					
MEMBER AGENCY SUPPLIES	2020	2025	2030	2035	2040
Surface Water	51,580	51,480	51,380	51,280	51,180
Water Recycling	40,459	43,674	45,758	46,188	46,858
Groundwater	17,940	19,130	20,170	20,170	20,170
Brackish Groundwater Recovery	12,100	12,500	12,500	12,500	12,500
Seawater Desalination	6,000	6,000	6,000	6,000	6,000
Potable Reuse	3,300	3,300	3,300	3,300	3,300
WATER AUTHORITY SUPPLIES					
IID Water Transfer	190,000	200,000	200,000	200,000	200,000
Supply from MWD	136,002	181,840	207,413	224,863	248,565
Coachella Canal and All American Canal Lining Projects	80,200	80,200	80,200	80,200	80,200
Carlsbad Desalination Plant	50,000	50,000	50,000	50,000	50,000
TOTAL PROJECTED SUPPLIES	587,581	648,124	676,721	694,431	718,773
TOTAL ESTIMATED DEMANDS¹	587,581	648,124	676,721	694,431	718,773
DIFFERENCE	0	0	0	0	0

¹ With Conservation.

Source: San Diego County Water Authority 2015 Urban Water Management Plan.

TABLE 3-3 SINGLE DRY WATER YEAR SUPPLY AND DEMAND ASSESSMENT (AFY)					
MEMBER AGENCY SUPPLIES	2020	2025	2030	2035	2040
Surface Water	6,004	6,004	6,004	6,004	6,004
Water Recycling	40,459	43,674	45,758	46,188	46,858
Groundwater	15,281	15,281	15,281	15,281	15,281
Brackish Groundwater Recovery	12,100	12,500	12,500	12,500	12,500
Seawater Desalination	6,000	6,000	6,000	6,000	6,000
Potable Reuse	3,300	3,300	3,300	3,300	3,300
WATER AUTHORITY SUPPLIES					
IID Water Transfer	190,000	200,000	200,000	200,000	200,000
Supply from MWD	263,340	264,740	263,340	260,680	258,720
Coachella Canal and All American Canal Lining Projects	80,200	80,200	80,200	80,200	80,200
Carlsbad Desalination Plant	50,000	50,000	50,000	50,000	50,000
TOTAL PROJECTED SUPPLIES	666,684	681,699	682,383	680,083	678,863
TOTAL ESTIMATED DEMANDS¹	629,198	694,147	725,006	743,990	770,765
DIFFERENCE²	37,486	(12,448)	(42,623)	(63,907)	(91,902)

¹ With Conservation.

² Potential shortages would be met from carryover storage and management actions.

Source: San Diego County Water Authority 2015 Urban Water Management Plan.

TABLE 3-4 MULTIPLE DRY WATER YEAR SUPPLY AND DEMAND ASSESSMENT (AFY)						
	Near Term			Long Term		
Scenario	2017	2018	2019	2036	2037	2038
Multiple Dry Years						
Demands	491,000	495,910	500,869	749,030	756,521	764,086
Supply	525,710	558,634	586,587	720,576	678,564	642,327
Potential Surplus or (Shortage) ¹	34,710	62,724	85,718	(28,454)	(77,957)	(121,759)

¹ Potential shortages would be offset through carryover storage and management actions.

Source: San Diego County Water Authority 2015 Urban Water Management Plan.

Otay Water District

Once water is made available by SDCWA, it is transferred across San Diego County in two aqueducts containing five large-diameter pipelines. The First Aqueduct includes Pipelines 1 and 2, and the Second Aqueduct includes Pipelines 3, 4 and 5. The OWD maintains several connections to Pipeline 4, which delivers filtered water from the MWD filtration plant at Lake Skinner in Riverside County.

In San Diego County, OWD provides water services to southern El Cajon, La Mesa, Rancho San Diego, Jamul, Spring Valley, Bonita, eastern Chula Vista, and Otay Mesa along the international border with Mexico. OWD covers approximately 80,000 acres, and has approximately 47,000 connections. OWD has approximately 709 miles of pipelines, 24 pump stations, and 40 reservoirs with a total storage capacity of 226 million gallons (mg). OWD provides approximately 90 percent of its water service to residential land uses, and 10 percent to commercial and industrial land uses. Average annual consumption for OWD is approximately 30,000 af. OWD maintains five major systems to supply and deliver water, which include Hillsdale, Regulatory, La Presa, Central, and Otay Mesa.

In addition, OWD's Flow Control Facility No. 14 and the Jamacha Road Pipeline delivers filtered water from the R.M. Levy Water Treatment Plant which is owned and operated by the Helix Water District. However, this connection currently supplies water to the north portion of OWD only. Furthermore, OWD maintains a connection to the City of San Diego's water system in Telegraph Canyon Road and has an agreement which allows the District to receive water from the Lower Otay Filtration Plant.

In June 2016, OWD's Board of Directors adopted the updated OWD 2015 UWMP. Sections 2, 3, and 4 of the 2015 UWMP provides an overview of OWD's service area, its current water supply sources, supply reliability, water demands, measures to reduce water demand, and planned water supply projects and programs. Section 5 of the 2015 UWMP contains OWD's water service reliability assessment. This section states that the level of reliability is based on the documentation in the UWMP's prepared by MWD and SDCWA and that these agencies have determined they will be able to meet potable water demands through 2040, during normal and dry year conditions. According to the 2015 UWMP, OWD currently relies on MWD and SDCWA for its potable supply, and OWD has worked with these agencies to prepare consistent demand projections for OWD's service area.

Current Drought Conditions

Since the time the Executive Order B-29-15 (EO) was issued by Governor Brown on April 1, 2015, statewide water conditions have improved. Mandatory water use reductions that were in effect in 2015 and the early part of 2016 have been lifted and both the SDCWA and OWD are in a Level 1 drought condition which encourages voluntary cutbacks to water use.

The Land Exchange Alternative will comply with all SWRCB and OWD regulations, emergency, or otherwise that are applicable and in effect at the time of building permit issuance. The Land Exchange Alternative will implement interior water conservation project design features.

The Land Exchange Alternative has also prepared a Water Conservation Plan (WCP, May 2017) that is specific to this project. The WCP evaluates mandatory and optional water conservation measures to be incorporated into the project and evaluates the potential water savings from the implementation of these measures.

The SDCWA and the OWD will continue to have a viable supply of water. The San Diego County Water Authority has worked diligently over the past decades to develop a diverse water supply for the region. The recently completed Carlsbad desalination plant and water transfers from the Imperial Valley are a few examples of how SDCWA has increased and diversified supplies to the area. SDCWA and its member agencies are working on several other projects to increase local supplies.

POTABLE WATER

The OWD will supply water to the Land Exchange Alternative from the 980 Zone of the District's Central Area System and the 1296 Zone of the Regulatory System. These systems will be interconnected by a pump station to be constructed within the Land Exchange Alternative. The 980 Zone accesses water from the SDCWA aqueduct by Otay Flow Control Facilities Number 10 and 12, which fill 624 Pressure Zone reservoirs. Water is then distributed within the 624 Zone and pumped to the 711 and 980 Zone storage and distribution systems. The 980-2 Pump Station pumps water directly from the 624 Zone to the 980 Zone system. The 980-1 Pump Station remains as part of the Central Area System to serve as a backup resource to the 980-2 Pump Station in the event it is needed.

The Regulatory System serves the eastern portion of the North District. Water is supplied to this area from Flow Control Facility 14 and a 36-inch line that feeds the 520 Zone Regulatory Reservoirs. From here, a series of pump stations, pipelines, and reservoirs form a series of higher pressure zones including the 1296 Zone that is located to the northeast of the Land Exchange Alternative.

To receive potable water service, the Land Exchange Alternative will need to expand the existing 980 Zone and 1296 Zone systems. The following details the existing potable water facilities located in the vicinity of the Land Exchange Alternative.

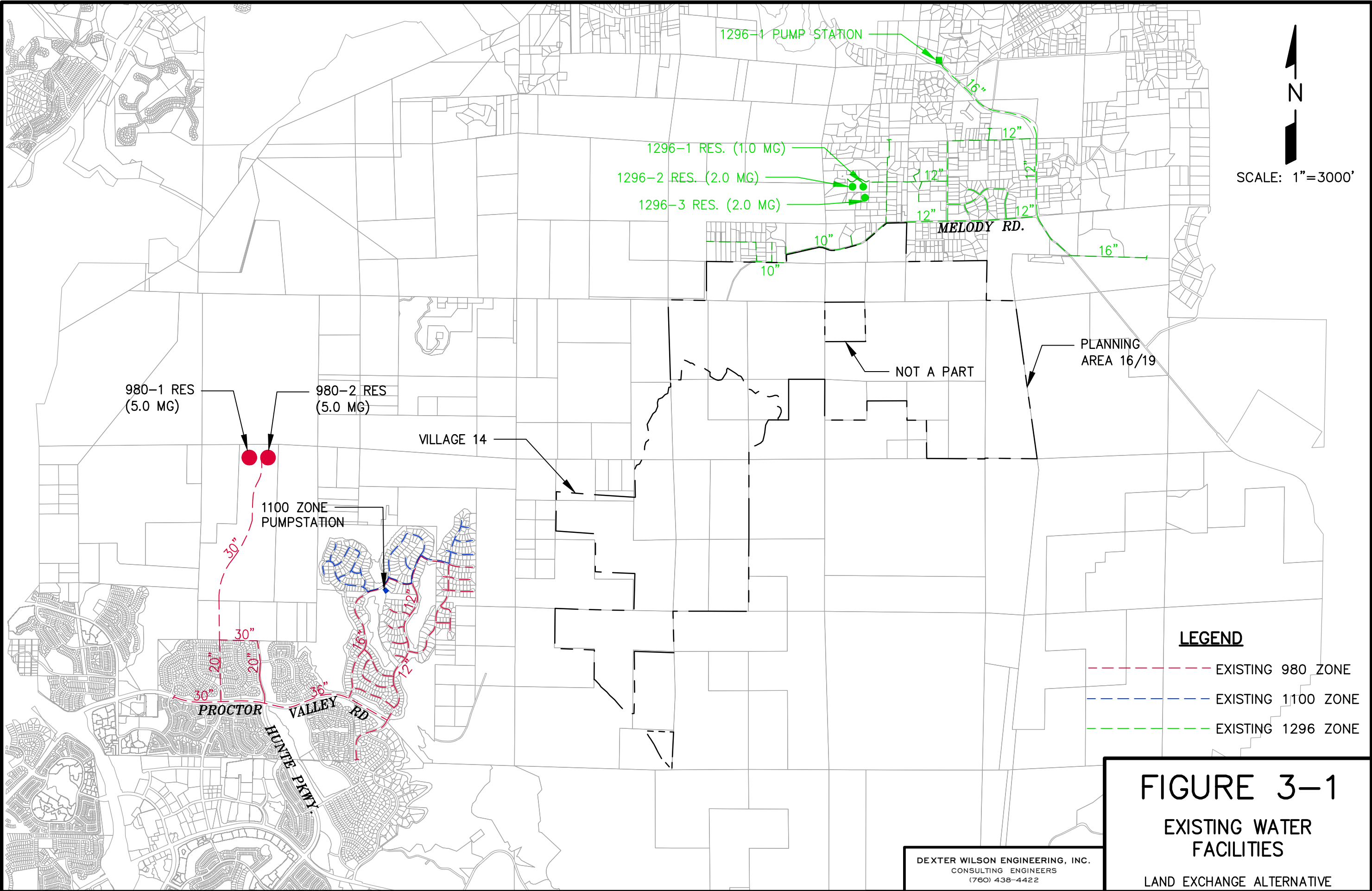
980 Zone

There are two existing pump stations in the 980 Zone: the 980-1 Pump Station referred to as the Eastlake Pump Station, located on the south side of Otay Lakes Road at Lane Avenue and the 980-2 Pump Station. The 980-1 Zone Pump Station, which currently has two active pumps and one standby pump that are all rated for 4,000 gpm and maintain a firm station capacity of 8,000 gpm, pumps water from the 711 Zone system into the 980 Zone distribution system, and into two existing 980 Zone reservoirs located in the OWD Use Area. The 980-2 Pump Station pumps water from the 624 Zone to the 980 Zone and currently has three duty pumps, one standby pump, and two empty pump cans for future expansion. This station has a firm pumping capacity of 12,000 gpm.

Both existing reservoirs in the 980 Zone are located at the same site within the OWD Use Area, north of Rolling Hills Ranch. These reservoirs each have a capacity of 5.0 million gallons, for a total of 10.0 million gallons. The location of these reservoirs is provided on Figure 3-1.

The major 980 Zone pipelines in the vicinity of the Land Exchange Alternative are all located west of the Land Exchange Alternative and include transmission lines in Hunte Parkway and Proctor Valley Road. The 36-inch transmission line in Proctor Valley Road has been extended to east of Hunte Parkway to the eastern most portion of Rolling Hills Ranch, as shown on Figure 3-1. This line was oversized to serve future development in Proctor Valley and to provide an interconnection between the Central and Regulatory Areas of OWD.

\\ARTIC\DWG\820007\LAND SWAP ALTERNATIVE\WATER\FIGURE 3-1.DWG 05-11-17 08:12:08 LAYOUT: LAYOUT



1296 Zone

There is one pump station that supplies the 1296 Zone. This station is located north of Lyons Valley Road near the 944 Zone Reservoirs and has four existing pumps and room for a fifth pump to be added in the future. This station has a firm capacity of 2,900 gpm and pumps water to three 1296 Zone Reservoirs located at the same site. These reservoirs have a total capacity of approximately 5.0 million gallons. Transmission and distribution lines in this area range from 8-inch to 16-inch and include a 10-inch line that is extended in Proctor Valley Road, just to the north of the Land Exchange Alternative.

CHAPTER 4

RECOMMENDED WATER FACILITIES

The Land Exchange Alternative will receive water service by expanding the existing 980 Zone and 1296 Zone water systems. Figure 3-1 provided the existing major water facilities in the vicinity of the Land Exchange Alternative and Figure 4-1 provides the recommended water facilities for the project. As discussed previously, a Subarea Master Plan(s) will be prepared prior to approval of final engineering improvement plans for the Land Exchange Alternative to identify the sizing and timing of all onsite and offsite water facilities for the project. The OWD Master Plan identifies a major north-south interconnection in this area to connect the Central Area and Regulatory Systems.

980 Pressure Zone

The Land Exchange Alternative would receive water service by expanding OWD's existing 980 Zone water system. The sizing and timing of all on-site and off-site water facilities for the Land Exchange Alternative site would be identified in a Subarea Master Plan to be reviewed and approved by OWD. The Subarea Master Plan would be prepared for the Land Exchange Alternative and submitted to OWD for approval prior to approval of final engineering plans.

The lower portion of the Land Exchange Alternative can be served from the 980 Zone by connecting to the existing 36-inch line in Proctor Valley Road and extending a 20-inch line to the Land Exchange Alternative. This line is identified in the OWD Master Plan and will be extended through the project to interconnect the 980 Zone and 1296 Zone. This 20-inch line will feed the proposed 1296 Zone Pump Station. The OWD Master Plan also identifies the need for a 2.0 MG 980 Zone Reservoir within Village 14 that will be fed from a 16-inch line. The redundant source of water for the 980 Zone will ultimately come from the 1296 Zone. This can be accomplished by installing a normally closed bypass line with a pressure reducing valve to allow water to be moved from the 1296 Zone to the 980 Zone in an emergency.

The anticipated range of pad elevations for areas that will receive service from the 980 Zone will be 609 feet to 830 feet. Service to these pads from the 980 Zone results in maximum static pressures ranging from 65 psi to 161 psi.

FIGURE 4-1
PROPOSED
WATER SYSTEM
LAND EXCHANGE ALTERNATIVE

980 Zone Reservoir. The required 980 Zone Reservoir capacity is to be sized for 1.3 times the maximum daily demands of the 980 Zone portion of the Land Exchange Alternative. Since this future reservoir will be connected to existing reservoirs in this zone, it is assumed that fire flow storage is already provided in the existing reservoirs. Table 4-1 summarizes the required 980 Zone storage for the project. OWD has master planned for this future reservoir to be sized for 2.0 MG.

TABLE 4-1 LAND EXCHANGE ALTERNATIVE 980 ZONE RESERVOIR STORAGE REQUIREMENT					
Average Day Demand, mgd	Maximum Day Demand, mgd	Emergency Storage, mg	Operational Storage, mg	Fire Flow Storage, mg	Total Storage, mg
0.579	1.56	1.56	0.47	0 ¹	2.03

¹ Fire flow storage is provided in existing 980 Zone reservoirs.

1296 Pressure Zone

The upper elevations of the project will be served from the 1296 Zone. The OWD Master Plan identifies a 1296 Zone Pump Station within Village 14 and a 20-inch transmission line in Proctor Valley Road north to the existing 1296 Zone system. The 1296 Zone portion of the Land Exchange Alternative is all residential and internal supporting facilities can be served by 8-inch and 12-inch distribution lines. A connection to the existing offsite 10-inch line to the north is proposed.

1296 Zone Pump Station. The 1296 Zone Pump Station will be required to have capacity to pump the maximum day demand of the 1296 Zone portion of the Land Exchange Alternative over a 16 hour period. Table 4-2 summarizes the required pumping capacity and for the purposes of this report a pump station capacity of 900 gpm is assumed. OWD has master planned for the station capacity to be increased to 4,000 gpm for regional benefit.

TABLE 4-2 LAND EXCHANGE ALTERNATIVE 1296 ZONE PUMP STATION CAPACITY REQUIREMENT					
Average Day Demand		Maximum Day Demand		MDD Over 16 Hours	
mgd	gpm	mgd	gpm	mgd	gpm
0.311	216	0.858	596	1.29	894